GEOGRAPHIC SCHOOL BULLETINS

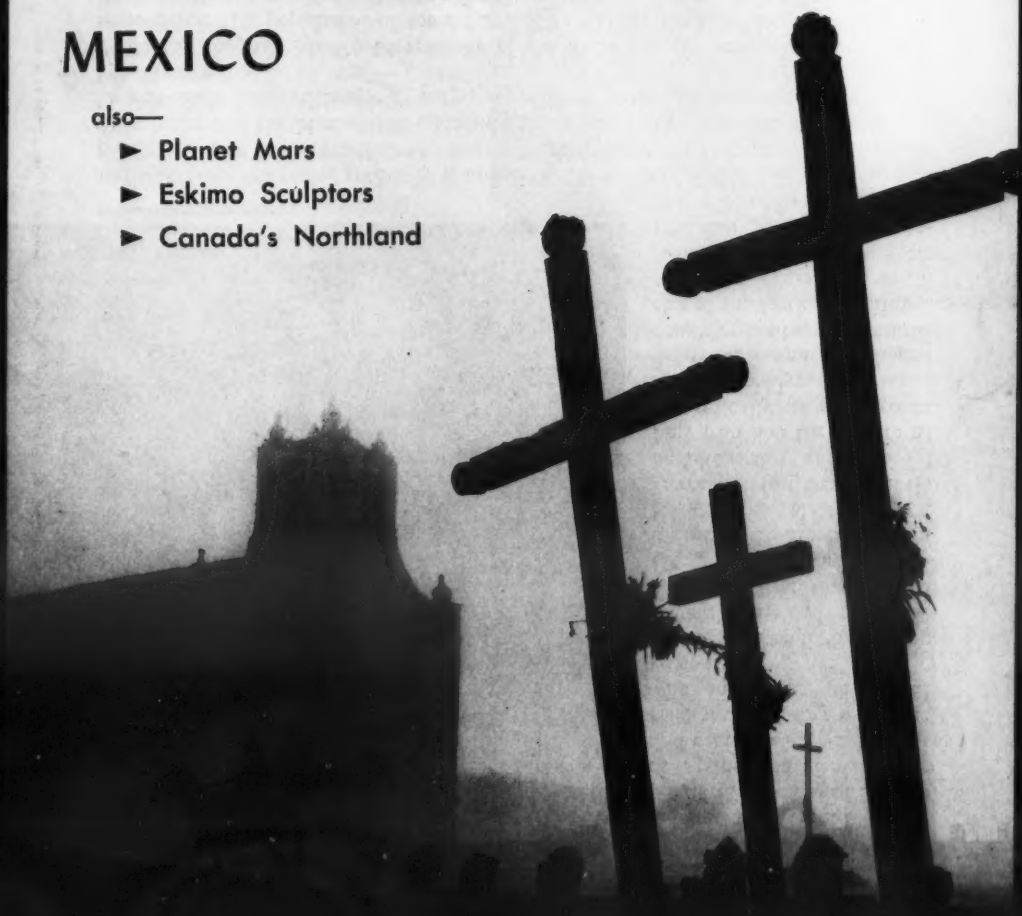
THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

DECEMBER 14, 1959, VOLUME 38, NUMBER 11 . . . *To Know This World, Its Life*

MEXICO

also—

- ► Planet Mars
- ► Eskimo Sculptors
- ► Canada's Northland



MERRY CHRISTMAS! Next issue, January 4, 1960

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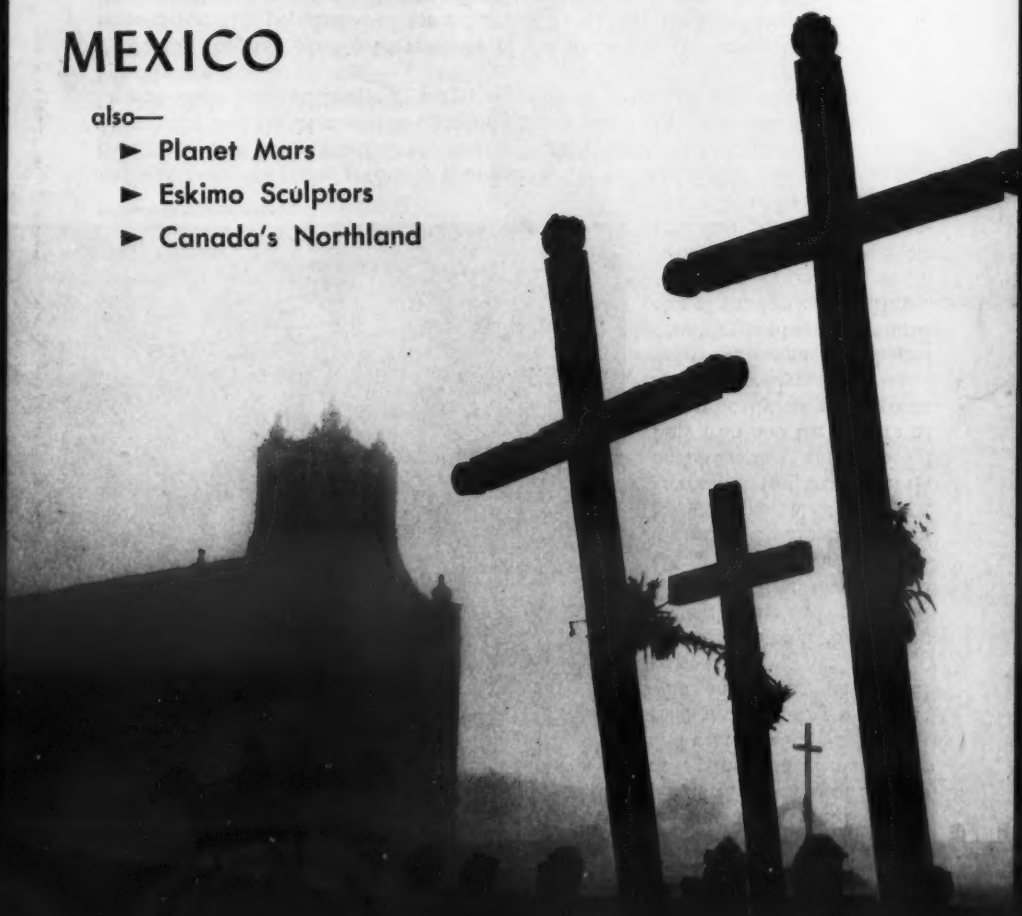

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volcanic. Most Mexicans live at a height of 3,000 feet or more. Mexico City is 7,800 feet above sea level, where the air is thin, and even natives must come down occasionally to relax—the high altitude causes nervous tension. It also makes water boil more quickly and tennis balls bounce harder.

Two mountain ranges—the Sierra Madres—together form a giant wishbone. Two forks curve from the United States border toward the center of Mexico. In the south they unite into a single range. Between the two prongs lies a tableland that rises from the Rio Grande. The southern part of this plateau, with a moderate climate and enough rain for farming, is where over half of Mexico's more than 32,000,000 people live. Arid land blankets the northern section.

The first to live on this land of mountains were Indians. The remains of the Maya empire which flourished long before Columbus can still be seen in Yucatán. New York jewelers still use the designs of Zapotec Indians who worked with silver

TARASCAN INDIANS walk colonial cobbled and eaves-hung streets of Pátzcuaro, above. A Tarascan of San Felipe, below, warms tortillas in her pottery-filled kitchen.

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PHOTOGRAPHS BY JUSTIN LOCKE

Tomorrow and Yesterday Meet in MEXICO

The traditional artist paints the picture of Mexico as a panorama of mountains and cactus, with sombreroed señors serenading señoritas who flirt fans on grilled balconies.

The realist paints the same scene, but he adds glass and steel buildings like Mexico City's Social Security Building at left. He brushes in refrigerators, electric lights, *mercados* (supermarkets), laundromats, and *beisbol* fans who boo the umpire as energetically as others once did in Brooklyn.

In this cornucopia-shaped country about one-fourth the size of the forty-eight States, there is room for both. New hydroelectric projects feed the power-hungry machines of humming factories, and tractor-driven plows gradually eliminate the Indian's plodding behind his oxen in the fields. The Indian continues to wear a bright-colored wool serape—a blend of the Aztec cape and the blanket the Spanish conquistadors slept on—but he travels in a Detroit-made bus. Although he may plow with ox-power, he sows the latest type of hybrid corn.

Mexico's capital, Mexico City, is one of the world's most cosmopolitan and handsome cities. Its population of some 3,300,000 makes it the third largest city in the Western Hemisphere. Skyscraping hotels, apartment houses, and office buildings, fashionable shops, restaurants, and theaters flank elegant, tree-bordered avenues. Suburbs bloom with new developments of look-alike houses.

Its modern sheen belies the fact that Mexico City is the oldest metropolis on the continent. It was a thriving Aztec center long before Cortés came, saw, conquered, and rebuilt it. Montezuma, the Aztec emperor, held court where the office of the Mexican President now stands.

Against this foreground, steeped in antiquity, seething with 20th-century life, the mountains roll away in the distance, changing color in every light. It is seldom possible anywhere in Mexico to be out of sight of the mountains, most of which are

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accompanied by their chaperons. All Mexico stops for a daily afternoon siesta. Spanish music is standard Mexican fare.

Mexico is coming into her own today. In 1810, the down-trodden Mexicans rose against the Spanish whip, finally won independence in 1821. But it took more than a century of dictators (with occasional democratic regimes) before the country achieved any kind of stability.

In 1934, the long-awaited reforms came. Big estates were broken up and distributed to the peasants. Today the *peon* gets more of his share from the cultivation of corn, sugar, tobacco, sisal, and coffee. Schools, hospitals, and roads were also built.

Irrigation projects have watered desert areas. Mechanized farming spreads. Better seeds, fertilizers, and pest control help grow bigger and better crops. Agricultural figures have soared. Mexico is now the world's second largest exporter of cotton and fifth largest producer of coffee. In the jungles of the Yucatán Peninsula, rubber, hardwoods, and sisal are produced.

Everything from refrigerators to instant coffee rolls off Mexican assembly lines, including paper, shoes, chemicals, textiles, and steel. In the last 20 years, the nation has quadrupled its output of manufactured goods.

The minerals which lured the Spaniards are still big league. Mexico leads the world in silver production and is an important miner of lead, antimony, zinc, copper, mercury, and graphite. Dams rise to furnish power and water in undeveloped areas. A new program seeks to pipe water into homes that lack it.

Still much remains to be done. In some villages houses are little better than clay huts. Many Mexicans are still poorly clad and poorly fed. About one-fifth of Mexico's people cannot read or write. L.B.

PHOTOGRAPHS BY JUSTIN LOCKE

MEXICO ON THE MARCH: Industry and agriculture boom as the nation takes its place in the 20th century. In Sonora, where Spanish pioneers extracted fortunes in gold, less precious but more strategic tungsten, cobalt, graphite, lead, and copper lure today's prospectors. Workers in a copper plant, right, in Mexico's chief copper state, chip rough edges off copper ingots before loading them into freight cars for shipment to the United States for reprocessing. In Yucatán, seas of sisal spikes grow where Maya Indians once built temples, developed the New World's first system of writing, and built a calendar as accurate as the Old World's Gregorian calendar. A farmer, above, harvests sisal, Yucatán's chief crop, used in making twine.

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and gold to the north. Mexico got its name from the Aztecs, whose war god was named Mexictli.

Today's daily Mexican fare, corn—from which the famous cornmeal pancake, the *tortilla,* is made —and *frijoles* (beans), was the daily food of Mexico's early Indians.

Arriving about 1325, the Aztecs built their capital where Mexico's capital now lies. Called Tenochtitlán, it stood on an island in old Lake Texcoco —now drained. Thousands of canoes thronged its waterways. The Indians laid out a great market place and built a massive temple.

Then in 1519, a handful of Spanish conquistadors looking for gold in the New World toppled the Aztec empire and reduced the Indians to slaves.

RAY MANLEY, WESTERN WAYS

The Spaniards ruled the country with the whip for 300 years. They lived in luxury on their estates while the Indians toiled in the fields and died in the hazardous silver and gold mines.

Mexicans threw off Spanish rule 138 years ago, but the Spanish marks on Mexico have never been erased.

Most Mexicans are of mixed blood. A few are pure Spanish or Indian. When the Spanish rebuilt Tenochtitlán European-style, they erected a Christian church and later a cathedral on the site of the principal Aztec temple. Roman Catholicism is still the religion of the majority of Mexicans (see cover). Although much of the Indian population continues to speak its native languages, Spanish is the official tongue.

The torero, daring the bull to charge his rose-colored cape in the Nogales, Sonora, bull ring, above, is hardly distinguishable from a scene in Madrid. Women of Acolman washing linen in a stream, and donkeys plodding along dusty roads take one to Aragon and Castile.

Spanish city and town names, such as Guadalajara, an old Moorish city in Spain, spot Mexican maps the way British names dot New England. The Spaniards brought not only their names, but their city and town planning. From Mexico City to the smallest town, the Spanish-style plaza, where colonial merchants traded in open markets, soldiers paraded, and townsmen gathered, is the focal point of community life. The larger the community, the more numerous the plazas. The colored tiled roofs, iron-grilled windows, and arched doorways that mark Mexico also spot Spain.

Spanish customs survive in Mexico. Many young girls still go out only when

change in Martian geography since the planet was first mapped 125 years before: a new blue-green area on its face, almost the size of Texas.

The new development indicates that a vast area of desert can spring into fertility, if, as Slipher believes, the green is due to vegetation. Like plants on Earth, these green areas turn gray, brown, or red when the Martian fall and winter come. If Mars were not a living planet, its winds would long ago have scattered dust and sand everywhere, rendering the whole surface a uniform tint. To Dr. Slipher, the canals suggest lines of vegetation along watercourses.

Although the planet—named for the Roman God of War—has been studied for centuries, we have few facts on hand.

A Martian day is 37 minutes longer than a day on Earth. Because the planet is farther away from the sun, it requires nearly twice the time to circle it, and a Martian year is 687 days. In size, Mars is just over half that of Earth—4,220 miles in diameter, compared with Earth's 7,927 miles. It has two tiny moons, Deimos and Phobos.

The men who make the first trip will take along warm clothing. Distance from the sun keeps Mars very cold: 70° to 80° Fahrenheit about noon near the Martian Equator, and as low as minus 95° Fahrenheit at night.

The planet has only a fraction of Earth's gravitational pull, and a 200-pound man here will weigh only 74 pounds on Mars. This lack of gravity denudes the planet of its atmosphere, and there is very little oxygen.

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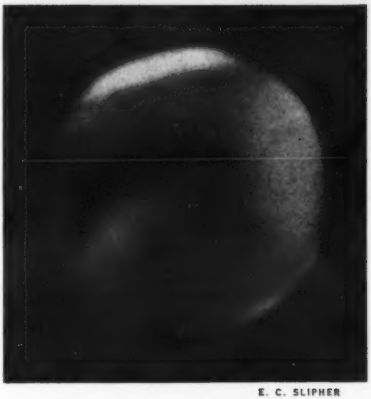
The Solar System, No. 4

PLANET MARS



E. C. SLIPHER

AT A SPACE STATION more than 1,000 miles from Earth, 12 men strap themselves into the contour chairs of the rocket ship and make a last minute check on the preparations for their historic flight.

The time is several decades in the future. The procedure is not new—the men have all rocketed from Earth to the space station and back many times. But the destination is new: the planet Mars, second stop (after the moon) on the space itinerary.

The final countdown blares over the ship's loudspeakers as its rocket engines rumble. Timing of the trip has been computed to the split second. In its annual trips around the sun, Mars very rarely swings as close to Earth as 35,000,000 miles. The space men must meet the planet when it is closest, a condition called opposition.

The trip will consume 260 days—about as long as a school year. The space ship cannot travel in a straight line because its fuel is limited. It must swing in a 735,000,000 mile arc to make use of the sun's gravitational field.

What will the pioneers find?

Will they find the "canals" first observed late last century that gave rise to the idea that a race of intelligent men engineered an ingenious system for distributing the rare and precious water over the planet? Or will this strange network of lines, incredibly straight and as much as 1,500 miles long, turn out to be some natural phenomenon, such as vegetation beside a watercourse, or fault lines of upheaved blocks of the planet's crust, or neat windrows of volcanic ashes? (The lines are shown in a modern sketch, below, with astronomers' names for other Martian features.)

Will the space travelers find life of any kind on Mars? Some scientists believe Mars resembles our own Earth 3,000,000,000 years ago, almost ready to produce life. Others are convinced it is a decrepit planet nearing the last stages of life. Still others think it is possible that Mars supports some simple form of vegetation.

Telescopic photographs show polar ice caps in winter (lower view, above) and central patches of blue-green in summer (upper view). Are they some form of vegetation which grows after the ice melts at the poles? Does this mean Mars has regular seasons similar to Earth's?

These exposures were among 20,000 taken by Dr. E. C. Slipher, leader of the National Geographic Society-Lowell Observatory Expedition of 1954. Dr. Slipher did not go to Mars, but he did the next best thing. He had a grandstand seat in Bloemfontein, South Africa, where, under a clear summer sky with Mars almost directly overhead, he could observe the planet when it swung closer to Earth than it had for 13 years: a mere 39,800,000 miles away.

Through the powerful telescope at the Lamont-Hussey Observatory, Slipher watched spring turn to summer on Mars. A polar cap warmed and shrank. Green fringes formed along the edge of the retreating ice or hoarfrost. He recorded the greatest

ESHIS WORLD IN STONE

CAPITAL PRESS SERVICE, OTTAWA

If bad weather persists, the sculptor will begin a new carving, perhaps a sea otter with a fish, like the one at bottom left. But he will not carve another walrus. He has proved he is a carver of walrus. He has no reason to repeat it.

Perhaps this time he will sculpt an angry bear roaring out of the sea. He saw such a one not long ago. Possibly he will give human form to a spirit, like the one in the picture at left. The human form intrigues him, and he has yet to carve a medicine man, such as the one at right. Nor has he ever attempted an owl like the one at far right. Perhaps a fitting subject would be a hunter about to harpoon his walrus, resembling the figures below.

He glances at his wife who is sewing black polar bear cutouts on a bleached sealskin background, "painting" a skin picture. Perhaps he will carve a mother carrying her child in a pouch in her parka, or a woman washing clothes in a tub. These are the scenes he sees every day, the subjects he is most familiar with.

Whatever he decides, his sculpture will be small. A hunter who is always on the move cannot burden himself with unnecessary bulk.

For however high he may rank among the world's sculptors, the Eskimo is a hunter first, an artist second. A life spent stalking, killing, dismembering, and eating the animals puts him on intimate terms with them.

The art of the Eskimo is personal. He creates for his own satisfaction, not just for commercial sale. But some of the best carvings find their way to the warmer side of the world. From a Canadian Governor General, President Eisenhower received a statue of a husky hunter slinging a goose over his shoulder. Prime Minister Nehru of India owns a stone walrus, presented by a Canadian diplomat.

L.B.

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THE ESKIMO SHAPESHI

THE SCULPTOR HUMS and chants as his hatchet cracks against the stone. From a shapeless piece of soapstone, a walrus slowly emerges.

The carver is an Eskimo. He whiles away days and nights when harsh winds and raging blizzards force him inside his igloo. He lives in the Canadian north, land of tundra, rocky headland, and ice pack (pages 130-132).

No model stands before him. He works from the memory of his last hunt and uncountable hunts before that. He uses no chisel, no mallet, no calipers. He carves with homemade hand drill, adz, saw, reamer, and hatchet, the tools he uses to build his kayak and fashion his harpoons. He has no wood —except driftwood, and little enough of that—no textiles or vegetable dyes. He shapes his sculpture out of the material at hand: native stone and ivory from the tusk of the walrus.

Completely untaught, he works by instinct—yet his carvings, with their simple lines, remind art-lovers of the work of modern sculptors. He discards irrelevant details; the finished work will proclaim the "walrusness" of the walrus.

Satisfied with his creation, he polishes it with stone dust and soaks it in seal oil to bring out the color. Then he wraps it in skin and puts it away. Shyly, and only on request, he will display it to visitors to fondle and admire. Custom forbids the sculptor to show any pride in his work.

Perhaps his walrus will bring its creator luck. Its charm may one day bring a walrus to look for clams where the Eskimo stands ready with his harpoon. This primitive belief that creating the likeness of something helps to materialize it may still persist among some Eskimos. Some have tried to carve animals which have disappeared from their hunting grounds in the hope that the statue would encourage the animals' return. Carvings have been placed on graves—miniature kayaks, sleds, and harpoons on the men's, tiny sewing kits, cooking pots, and lamps on women's—to serve the deceased in the spirit world.

NORTHERN ART—Old Dan McGrew would spin in his cold grave. Here is a new, booming mining town with art classes instead of lawlessness that was the trademark of the earlier gold rushes. Yellowknife, District of Mackenzie, boasts waterworks, sewage system, a Red Cross hospital, and a modern school, better equipped than some in southern Canada. In the evenings, instead of gathering in the "Malemute saloon" to "whoop it up", Yellowknife residents take over a schoolroom for a class in painting.

SYMBOL of the change in Canada, Uranium City, Saskatchewan, had traffic and parking problems soon after it was established, although no road connects it with the outside. Some of its buildings were dragged by tractor from the abandoned town of Goldfields when uranium surpassed gold as the "get-rich-quick" mineral.

THE CANADIAN NORTH is big. If defined as the Northwest Territories and the Yukon, it equals in size half the United States without Alaska. Its area north of treeline (the true Arctic) totals more than a million square miles. Part of it is covered by a huge rock formation called the Canadian Shield, made up of some of the oldest rock known in the world.

This vast stone face, that once repelled travelers, is now the attraction—for within it lie masses of uranium, iron, nickel, titanium, lithium, in fact, "almost every mineral known to man," as a Canadian official put it. The rugged land is not a perpetually frozen waste where nothing grows. Summer days can be hot. There are flowers, bees, and, alas, mosquitoes. In Yellowknife, only 300 miles south of the Arctic Circle, tomatoes, strawberries, and other fresh fruits and vegetables are grown in market gardens. Long summer days—with as much as 18 hours of sunlight apiece—make up for the short growing season. F.S.

NATIONAL GEOGRAPHIC PHOTOGRAPHER VOLKMAR WENTZEL; GEORGE HUNTER, OTTAWA, LEFT

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Canadians Shatter Arctic Stillness

THE AIRPLANE'S motor stops, and the only sounds in the Arctic stillness are the *chink* of the prospector's hammer and, hopefully, the *click-click-click* of a Geiger counter coming faster and faster until it rattles out the message "uranium!" The plane flies away, its echoing exhaust to be followed by the rumble of bulldozers, the shouts of miners, and the soft rustle of Canadian dollars flowing in. These are the earmarks of Canada's Northland, an area once sneered at as only a "pile of rocks and Christmas trees," now a booming mineral treasury. Men are learning to live in its vastness, fighting the elements with one hand, working with the other. As more riches are found—and no one doubts they will be —Canada's North must continue to develop.

Although today the market for uranium is weakening, other vital metals are in growing demand, and the endless quest for ore deposits goes on.

GEORGE HUNTER, OTTAWA; RICHARD HARRINGTON, THREE LIONS, LEFT

WHILE CHANGING the human geography of the North, the newcomers are also twisting its language, making verbs from nouns as they need them. At right, uranium hunters "geiger" a hole in a rock face —insert the tip of a Geiger counter to see if there is enough reaction to warrant deeper digging. They work underground at Beaverlodge, Saskatchewan, named for the former sole source of wealth in the area. Now most trappers have abandoned their lines to seek minerals.

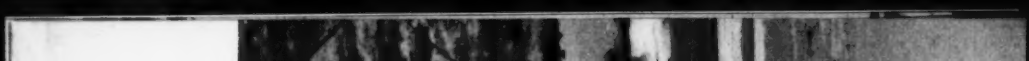
GENE GAINES, PIX

LABORING ASHORE like waddling ducks, Navy landing craft deliver supplies to a Distant Early Warning Line outpost on Baffin Island, off Canada's Arctic coast. Such supply missions can succeed only when summer sun cracks the ice pack into floes. In a similar operation each summer, the Canadian Ministry of Transport moves a vast supply fleet into Arctic waters to refuel and refeed the inhabitants of the desolate, treeless coastlines. This year a record 80,000 tons was shipped.

MILITARY OPERATIONS, such as the DEW Line supply mission at left, have shown the way to conquering of the Arctic.

DEW Line engineers devised buildings on stilts so that blizzard-driven snow would blow along beneath without crushing the buildings. They invented a whole new radio system to overcome magnetic problems.

Even more, the DEW Line belts the Far North with a series of stations. You may now fly across the continent without losing sight of the lights of human habitation and rarely being more than 25 miles from an airstrip.

Where the military led, others have followed. Vice Admiral Richard H. Cruzen, USN (Ret.), project chief of the DEW Line, told *National Geographic* writer Howard LaFay, "So many people drop in on us up here—mostly prospectors—that it's become a nuisance. In the middle of nowhere, we've been forced to put up 'Keep out' signs." F.S.

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